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to understand, as both the leaf and acorn are eminently fitted to terminate one extreme of the series of which *Phellos* is the other, as I have endeavored to show in the accompanying plates. The only cause for hesitation which I have in accepting this as a satisfactory conclusion is that I failed to find trees of *rubra* growing in the immediate vicinity, although there are a number of them only a few hundred yards away. We should however remember that this species may have been present, associated with *Phellos*, years since, at the time when the existing large specimens of *heterophylla* were produced, probably 50 or 75 years ago. It may be that hybridization has not taken place in many years and that the young trees are merely seedlings from a few originals. This idea is strengthened in my mind from the fact that the largest and oldest trees come nearest to the type of *rubra*, while the smallest or youngest trees show a preponderance of the *Phellos* type—apparently showing a tendency to revert back to it. Dr. N. L. Britton has also pointed out to me a significant fact in this connection, viz.: that throughout the region where *heterophylla* has been found *Phellos*, *rubra*, and other members of the black oak group occur, but that to the eastward, in the Pine Barren region, *heterophylla* or *rubra* are not reported, although *Phellos* is abundant and *palustris* and other black oaks are present. In fact *heterophylla* only seems to occur where *Phellos* and *rubra* occupy a territory in common.

Algæ from Atlantic City, N. J.

COLLECTED BY S. R. MORSE.

The following species were collected at various times during the years 1884 to 1888 inclusive, and the specimens sent to me for examination; also in May, 1885, Mr. Morse and myself spent a few days together collecting. While this is certainly not a complete list of the algæ of Atlantic City, it contains quite a large number for a locality having no rocky shore whatever, but an open sandy beach in front, and muddy creeks and marshes in the rear.

Glœocapsa crepidinum, Thuret. Common on woodwork.

Entophysalis granulosa, Kütz. On shells, etc. Not previously reported on the American coast.

Polycystis pallida (Kütz.), Farlow. Mixed with other Cryptophyceæ.

Clathrocystis roseo-persicina, Cohn. Abundant on the marshes.

Sphærozyga Carmichælii, Harv. Common on muddy flats, and in shallow pools in the marshes.

Spirulina tenuissima, Kütz. In small quantity, mixed with *Oscillarias*, etc.

Oscillaria subuliformis, Harv. Mixed with other Cryptophyceæ.

O. subtorulosa (Bréb.), Farlow. With the preceding species.

Microcoleus chthonoplastes, Thuret. On the marshes, mixed with other algæ.

Lyngbya majuscula, Harv. Not uncommon, floating.

L. æstuarii, Liebm. Common on marshes, etc.

L. tenerrima, Thuret. In small quantity, among other algæ.

Calothrix confervicola, Ag. On various algæ.

C. crustacea (Schous.), Born., et Thur. On various algæ, frequently mixed with the preceding.

C. scopulorum, Ag. On woodwork, etc.

C. pulvinata, Ag. Common on piles of wharves and bridges.

Rivularia hospita, Thuret. On an oyster shell.

Isactis plana. Thuret. On shells.

Monostroma crepidinum, Farlow. On woodwork in a tidal creek.

Ulva Lactuca (L.), Le Jolis. Common, including var. *rigida*, Le Jolis, and var. *latissima*, Le Jolis.

U. enteromorpha, Le Jolis. Very common, including var. *lanceolata*, Le Jolis, var. *intestinalis*, Le Jolis, var. *compressa*, Le Jolis.

U. clathrata, Ag. Common, including var. *ramulosa*, and var. *erecta*, Le Jolis.

U. Hopkirkii (McCalla), Harv. Not very common.

U. marginata, Le Jolis. Not very common.

U. percursa, Ag. Rather common in tide-pools, mixed with other algæ, from which it is hardly distinguishable except by microscopic examination.

U. aureola, Ag. Not uncommon on woodwork.

Ulothrix flacca (Dillw.), Thuret.

U. isogona, Thuret. These two species not uncommon on woodwork and other algæ. A very slender form grows on *Bos-*

trychia rivularis, possibly distinct from either of the foregoing.

Chætomorpha Picquotiana (Mont.), Kütz.

C. Linum, Kütz. It is impossible to draw the line between these two species in the Atlantic City specimens. Typical forms of each may be found, and so can every shade between them.

Rhizoclonium riparium, Roth. Common.

Cladophora albida (Huds.), Kütz. Beside the type, a plant occurs, which seems to be the *C. refracta* of Harvey, (Phyc. Brit.,) and is probably a form of *C. albida,* in which Hauck (Deutschland's Meeresalgen) includes *C. refracta* of Harv. and Kütz. The plant of the New England coast which I take to be the *C. refracta* of Farlow's Man., is quite distinct. Hauck places the latter as *forma refracta* in *C. hamosa,* Kütz.

C. glaucescens, Harv. Not uncommon.

C. Hutchinsiæ, Kütz. Not uncommon. Luxuriant specimens from Longport, collected by Mrs. Lawton.

Cladophora flexuosa, Harv. A doubtful species, but some specimens found at Atlantic City seem to belong here.

C. gracilis (Griff.), Kütz. Common and variable.

C. expansa, Kütz. Common, especially in marsh tide-pools.

Bryopsis plumosa (Kütz.), Ag. Not uncommon.

Phyllitis fascia, Kütz. Common.

Scytosiphon lomentarius, Ag. Common.

Punctaria latifolia, Grev.

P. latifolia, Grev., var. *Zosteræ,* Le Jolis.

P. plantaginea (Roth.), Grev. All three forms rather common.

Dictyosiphon fœniculaceus, Grev. Common, including forms which appear to be var. *flaccidus,* Aresch.

Myriotrichia clavæformis, Harv.

M. clavæformis, Harv., var. *filiformis,* Farlow. On *Scytosiphon* and *Phyllitis.*

Ectocarpus terminalis, Kütz. On *Zostera.*

E. tomentosus (Huds.), Lyng. Rather common.

E. granulosus, Ag. Not uncommon.

E. confervoides (Roth.), Le Jolis. Very common.

E. confervoides, var. *siliculosus,* Kjellman. Almost as common as the type.

E. littoralis, Lyngb. Very common and variable. Among other forms the var. *brachiatus*, Ag. (*E. ramellosus*, Kütz.)

Myrionema vulgare, Thur. Common.

Elachistea fucicola, Fries. Common on *Fucus*.

Leathesia difformis (L.), Aresch. Not very common; generally of small size, growing on *Zostera*.

Chordaria flagelliformis, Ag. Have only seen a few plants.

Mesogloia divaricata, Kütz. Not uncommon.

Ralfsia verrucosa, Aresch. A small form, growing on wood-work.

R. clavata (Carm.), Crouan. With the preceding.

Laminaria saccharina (L.), Lamour. Not rare, but not so common nor so luxuriant as further north. Washed ashore from below low water mark.

Ascophyllum nodosum (L.), Le Jolis. Common.

Fucus vesiculosus, L. Common.

F. furcatus, Ag. A single plant, washed ashore, apparently having grown on a mussel bed below low water mark. Not exactly like the form as found on the New England coast; having some resemblance to *F. evanescens*, Ag.

Sargassum vulgare. Ag. Have only seen a few plants; apparently not very common.

Vaucheria Thuretii, Woronin.

V. litorea, Nordstedt. Have seen only sterile plants of these two species, so that the determination is not certain.

Trentepohlia virgatula (Harv.), Farlow. On *Zostera* and algæ.

Porphyra laciniata, Ag.

P. leucosticta, Thuret. Both species common and often confounded.

Bangia fusco-purpurea, Lyngb. Rather common.

Erythrotrichia ceramicola (Lyngb.), Aresch. On various algæ.

Callithamnion cruciatum, Ag. Not uncommon. This species is distributed along the Atlantic coast of Europe and North America, and also in the Mediterranean, and is not a rare species anywhere in those limits. The cystocarpic fruit, however, has been considered extremely rare, the only record of its occurrence being at Brest, France, reported by Crouan. At Atlantic City, however, the cystocarpic fruit seems to occur quite commonly, a considerable proportion of the plants collected by Mr. Morse having it in abundance.

C. Borreri, Ag. Common.

C. roseum (Roth.), Harv. Sterile, and therefore doubtful.

C. byssoideum, Arn. Rather common.

C. tenue, Harv. Not uncommon in thoroughfares, etc. Though this species has been known for forty years or more, the cystocarpic fruit has never been found, and by European writers it is generally placed in the genus *Griffithsia*, which it resembles in habit more than it does *Callithamnion*.

Ptilota elegans, Bonnem. Not uncommon, washed ashore.

Ceramium rubrum, Ag. Common.

C. strictum (Kütz.), Harv. Common, varying from the type to a robust, widely branching form, which is very near, if not actually, *C. diaphanum*, Roth.

C. fastigiatum, Harv. Not uncommon.

C. tenuissimum (Lyngb.), Ag. Not uncommon.

C. tenuissimum, var. *patentissimum*, Harv. With the type.

Spyridia filamentosa, Harv. Not uncommon.

Phyllophora Brodiæi, Ag.

P. membranifolia, Ag. Both from deep water; not very common nor very large plants.

Cystoclonium purpurascens, Kütz. Not uncommon.

Chondrus crispus (L.), Stack. Common.

Rhodymenia palmata (L.), Grev. Not uncommon.

Lomentaria uncinata, Menegh. Common; often luxuriant and very handsome; sometimes appearing to be var. *robusta*, Harv.

L. uncinata, var. *filiformis*, Harv. With the type, less common.

Champia parvula (Ag.), Harv. Common.

Gelidium crinale, Ag. Probably not uncommon, but inconspicuous and easily overlooked.

Rhabdonia tenera, Ag. Common.

Grinnellia Americana, Harv. Abundant and luxuriant.

Delesseria sinuosa, Lamour. From deep water; not uncommon.

D. Leprieurii, Mont. Abundant at low water mark on the piles of railroad bridges, etc., with *Bostrychia rivularis*.

Gracilaria multipartita, Ag.

G. multipartita, var. *angustissima*, Harv. Both type and variety common.

Chondriopsis tenuissima, Ag.

C. tenuissima, var. *Baileyana*, Farl. Both common.

Polysiphonia urceolata (Dillw.), Grev. Not very common.

P. Harveyi, Bail. Common.

P. variegata, Ag. Common.

P. atrorubescens, Grev. Not very common.

Polysiphonia nigrescens, Grev. Common and variable; including many forms between the two extremes, var. *fucoides*, Ag., var. *affinis*, Ag.

Bostrychia rivularis, Harv. Common on bridges, etc.

Dasya elegans, Ag. Common.

Melobesia farinosa, Lamour. On *Phyllophora;* rare.

FRANK S. COLLINS.

Notes on the Development of Corynites Curtissii, B.

Plate LXXXVI.

In July, 1887, while studying at Cambridge, I was fortunate enough to find in a small patch of woods a number of specimens of undeveloped *Phalli*. Watching them with interest for a week or ten days, a fully developed specimen was found which proved to be *Corynites Curtissii*. The development of these specimens was so interesting that it is here put upon record, together with some of the figures drawn at the time.

Arranged in the apparent order of their development they are numbered one to ten on the plate. The first figure shows the outer wall surrounding a mass of grayish, glairy matter, in the centre of which is a white column, surmounted by a two-lobed mass of dark brown or blackish matter. Figure 2 shows the beginning, in the centre of the column, of what is eventually to be the stipe, the dark mass still present at the top. In figure 3 the dark mass is larger. Figure 4 shows a marked change. The stipe begins to be plainly manifest. The little pits represent what develop finally into openings; the second layer represents the inner wall of the peridium, while the dark mass of matter at the top, gradually diminishing in size, is what probably eventually forms the gleba and contains the spores. Figure 5 does not show the stipe, a fact which may be due to a defect in sectioning, but the gleba (?) has diminished in size and is partly torn away from the central column. Figure 6 is a much more advanced